reagents, and the method further comprises the step of mixing the nucleic acid with the reagents in the reagent chamber prior to forcing the nucleic acid to flow into the reaction chamber.

79. The method of claim **76**, wherein the step of lysing the sample components comprises transferring ultrasonic energy to the lysing region using an ultrasonic transducer coupled to a wall of the lysing region.

80. The method of claim **76**, wherein the volume of sample forced to flow through the extraction chamber is greater than the volume of elution fluid forced to flow through the extraction chamber, whereby the analyte extracted from the sample is concentrated in the smaller volume of elution fluid.

81. The method of claim **76**, wherein the volume of sample forced to flow through the extraction chamber is greater than the volume capacity of the extraction chamber.

82. The method of claim **76**, wherein the ratio of the volume of sample forced to flow through the extraction chamber to the volume capacity of the extraction chamber is at least 2:1.

83. The method of claim **76**, wherein the volume of sample forced to flow through the extraction chamber is at least 1 ml.

84. A method for separating an analyte from a fluid sample, the method comprising the steps of:

a) introducing the sample into a cartridge having:

i) a lysing region for lysing sample components to release the analyte therefrom; and

ii) a flow-through chip for capturing the analyte the chip comprising a body having an extraction chamber and an array of microstructures extending into the extraction chamber for capturing the analyte, wherein each of the microstructures has an aspect ratio (height to width) of at least 2:1;

b) lysing the sample components in the lysing region;

c) forcing the lysed sample to flow through the extraction chamber and out of the chip, thereby capturing the analyte with the microstructures in the extraction chamber;

d) eluting the captured analyte from the chip by forcing an elution fluid to flow through the extraction chamber and out of the chip;

e) forcing the eluted analyte to flow into a reaction vessel coupled to the cartridge;

f) reacting the analyte in the reaction vessel; and

g) detecting a reaction product;

wherein the reaction requires temperature control of the reaction vessel, and the method further comprises the steps of inserting the vessel into a thermal sleeve and heating or cooling the vessel according to a time/temperature profile.

85. The method of claim **84**, wherein the analyte comprises nucleic acid, and wherein the steps of reacting the analyte and detecting the reaction product comprise amplifying the nucleic acid and detecting the amplified nucleic acid.

86. The method of claim **84**, wherein the cartridge further includes a reagent chamber containing dried or lyophilized reagents, and the method further comprises the step of mixing the eluted nucleic acid with the reagents in the reagent chamber prior to forcing the nucleic acid to flow into the reaction vessel.

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